

Original Article

Sleep Quality in the Elderly and Its Associated Factors in Neyshabur, Mashhad-Iran

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Abstract

Introduction: Aging is a period of life associated with various challenges and changes. Considering the importance of the physical, mental, and psychological effects of sleep on the fitness of the elderly, the present study aimed to review sleep quality (SQ) in the elderly and its associated factors.

Methods: This cross-sectional study was performed on 481 aged people referred to comprehensive health service centers in Neyshabur in 2023. Sampling was performed using stratified random sampling. The data were gathered using demographic questionnaires and the Pittsburgh SQ Index (PSQI). Finally, univariate analysis and multiple linear regression were used to evaluate the relationship between demographic variables and SQ scores using SPSS 16.

Results: The mean age ($\pm$ standard deviation) of the participants was 68.89 ($\pm$ 7.32) years. Further, the mean ($\pm$ SD) of SQ in the elderly was 6.17 ($\pm$ 3.54), and 40.1% had poor SQ. Based on multiple linear regression analysis results, marital status ($P=0.028$), drug use ($P=0.003$), wealth index ($P=0.004$), and anxiety ($P<0.001$) had a significant relationship with SQ.

Conclusion: The findings indicated that nearly half of the elderly had poor SQ. Therefore, it is recommended that policymakers and planners in the field of aging focus on socioeconomic factors affecting the elderly in order to make policies and provide better and more services to improve the SQ.

Keywords: Sleep quality, Health, Aged people



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Introduction

Population aging is a serious problem in most advanced countries worldwide. Keeping aged people healthy and impartial as long as possible contributes to their quality of life; however, it is equally important to pay attention to the need for expert care so that to lower the economic burden for society (1). The share of the elderly in the worldwide population, with an unexpected rate of development, and their extended lifetime are associated with increased risks of disease and dependency (2). In 2023, there have been a predicted 961 million elderly people aged 60 years and older, and this variety is projected to increase to 2 billion by 2025. Notably, the majority of this developing population will be living in growing countries (3,4). By comparing the population pyramid in past decades, it can be concluded that the elderly population will rapidly increase in the coming decades in Iran (5). Iran's elderly population over 60 years old is reported to be about 9

million and 850 thousand, of whom 5 million and 150 thousand are women and 4 million and 700 thousand are men (6). Aging is a vital and inevitable part of life, characterized by physiological and mental changes. It is a complicated process that influences all living creatures, including humans (7). As adults grow older, their sleep patterns undergo widespread changes, causing sleep disorders (8). Sleep duration and sleep quality (SQ) are both essential components of sleep (9). SQ, which commonly refers to the subjective and goal traits of sleep that determine its usual efficiency, is related to more than one effect on physical, mental, and cognitive health (10,11). SQ is a crucial indicator for assessing the presence of sleep disorders. Globally, the incidence of poor SQ in older adults is high (8). In recent studies conducted in Iran, 90.1% and 52.4% of the elderly reported poor SQ (11,12). Sleep disturbances are related to a wide variety of unfavorable fitness outcomes, consisting of fatigue,



frailty, cardiovascular diseases, intellectual disorders, and even mortality (12,13). Moreover, in a study conducted in 2024, the prevalence of good, moderate, and poor SQ was estimated at 70.5%, 25.3%, and 4.2%, respectively (14).

Several factors can affect SQ in the elderly, including gender, loneliness, marital status, illiteracy, better socioeconomic status, better body mass index, and obesity (15-20). Both sleep duration and SQ are probably influenced by environmental and lifestyle factors, such as worrying schedules. Moreover, irregular routines, such as those caused by shifts, poor diets, loss of bodily activity, and immoderate exposure to digital devices, noise, ambient light, and sleep, can be affected by physiological elements consisting of body weight, sleep apnea, and iron deficiency (21). It seems that the need to pay attention to the psychological aspects of the elderly, including their support, is one of the current and future priorities of countries that have experienced an increase in the elderly population. Considering that recent studies have shown that today's elderly report more sleep problems than those of previous generations, a trend that is exacerbated by increasing social stratification, this study is especially important in a developing country like Iran (22). Therefore, the present study seeks to investigate SQ and its related factors in the elderly referred to comprehensive health service centers in Neyshabur in 2023. It is hoped that the findings of this study will help researchers choose the best strategies and programs to improve the sleep status of the elderly.

Methods

This cross-sectional study was performed on 481 elderly individuals referred to comprehensive health service centers in Neyshabur in 2023. Using G. Power software (version 3.1.9.2), the sample size was determined to be 436 elderly people, considering the primary type of errors of 0.05, a power of 0.95, and a small effect of 0.2 (23). This number was increased to 481, taking into consideration a 10% drop in samples or questionnaires that had been completed incorrectly. Sampling was performed using stratified random sampling. In this way, all health centers in Neyshabur were considered as one cluster. In line with the aged population protected by each center and the size of the sample, the instances were selected from elderly individuals referring to the hospital for a specific service. For data collection, the researchers attended the health centers in Neyshabur and studied all the elderly people who had referred to the health centers to receive health services, considering the inclusion criteria. These criteria included being 60 years and older, residing in Neyshabur, being able to understand and speak Persian, having a health record, showing a willingness to participate in the study, and suffering from no debilitating physical or mental illness. After being informed of the purpose of the study and data confidentiality, written consent was obtained from the participants, and the questionnaires were completed through interviews.

Procedure

The elderly completed a two-part questionnaire, including items related to demographic statistics and SQ. The questionnaire included demographic information, including age, gender, education level, employment, living situation (with whom), history of drug use, number of children, wealth index, anxiety status using Beck's Depression Scale, and amount of physical activity (minutes per week). To calculate the wealth index as a composite scale of the cumulative well-being of aged people, records of their possession of property were accumulated, and a fundamental evaluation was used for this purpose. The wealth index is a composite measure of the cumulative living standard of a household. It is computed using facts on a household's possession of a decided set of assets, including televisions, bicycles, and cars, as well as living traits, including floor material, type of drinking water source, and bathroom and sanitation facilities. The wealth index considers traits that can be associated with wealth status, averting variables that do not constitute an asset or final variables. To calculate the wealth index as a composite scale of the cumulative standard of living of the elderly, data on the ownership of assets of the elderly were collected, and principal component analysis was used accordingly. Based on the analyses, people were placed in one of the spectrums (the poorest to the richest) in terms of the amount of wealth rather than income (24).

The level of SQ of the study population was evaluated using the 19-item Pittsburgh SQ Index (PSQI), which was tested on the elderly by Sheikhy et al (25). The self-reported PSQI questionnaire determines the SQ of members during the last month and the rating of the PSQI stages from 0 to 21; a decreased rate indicates higher SQ, while a rate > 5 represents bad SQ. The sensitivity and specificity of the PSQI tool were 100% and 93%, respectively (25).

Data Analysis

The obtained data were analyzed using SPSS software, version 16. To describe the data, means and standard deviations, as well as frequencies and percentages, were used for quantitative and qualitative variables, respectively. Before performing parametric tests, the normality of data distribution was investigated through the Kolmogorov-Smirnov test. Then, an independent t-test was employed to compare the means of the two independent groups. In addition, the analysis of variance was utilized to compare the mean of more than two groups. Eventually, multiple linear regression was used to investigate the relationship between the dependent variable and independent variables. All analyses were performed at a significance level of 0.05.

Results

The mean age $\pm$ standard deviation (SD) of the participants in this study was 68.89 ± 7.32 years. Out of the total participants, 49.3% were male and 50.7% were female. Most participants (43.5%) were unemployed, and 66.5%

of them were married. In addition, most participants (74.6%) had a history of taking medicine (Table 1).

Our findings revealed that the mean ($\pm$ SD) of SQ in the elderly was 6.17 ($\pm$ 3.54), and 40.1% had poor SQ.

Based on the results of multiple linear regression analysis (Table 2), there was a significant relationship between some demographic variables and SQ scores. Marital status affected SQ scores, with divorced individuals having lower scores on SQ ($B = -3.51$, $P = 0.028$), indicating better SQ compared to single people. Further, the use of certain medications was associated with an increase in SQ scores ($B = 1.064$, $P = 0.003$), representing lower SQ in these people. The wealth index also had an impact on SQ, with people at the highest level of wealth having lower scores on SQ ($B = -1.513$, $P = 0.004$) and better SQ. In addition, higher anxiety scores were associated with increased SQ scores ($B = 0.112$, $P < 0.001$), implying the negative effect of anxiety on SQ. Other variables, such as place of residence, number of children, and lower wealth levels, showed no significant correlation with SQ.

Discussion

This study investigated SQ and its related factors in the elderly of Neyshabur in 2023. The results revealed that 40.1% of the elderly had poor SQ, which is in line with the findings of previous studies (26-28). However, the results of the study performed by Sadri Damirchi et al (29) contradict those of the present study. These contradictory results can be due to differences in the sample, measurement methods, or cultural conditions. Based on a comparison between the results of these studies and those of the present study, sleep assessment in this population should be regularly considered in comprehensive health centers so that in the case of detecting poor SQ, various interventions and strategies should be considered, with an emphasis on counseling and psychological approaches (30).

The findings further demonstrated that SQ was related to age. In general, with age, SQ decreases in stages 3 and 4, which are related to deep sleep (31). In this study, the SQ score decreased with each year of age increase in the elderly. The role of aging in decreasing SQ has been emphasized in most previous studies (32-34).

Another result of the present study was that SQ was related to drug use. In other words, those with a history of drug use had an SQ score 1.3 times higher than those who did not have a history of drug use, which is in line with the findings of previous studies (32,35). It seems that, along with other sleep disruptors, the use of some drugs has a negative effect on the regular circadian rhythm of sleep due to their side effects and causes poor SQ in the elderly (36). Moreover, SQ was associated with well-being status. More precisely, older adults who had a wealth index (rich status) score were 1.8 times better than those who had a wealth index (poorest status) rating, which conforms to the findings of some studies (26,37,38). It can be concluded that the existence of a good income as a sponsor makes

Table 1. Demographic Characteristics of Participants (N=481)

Variable	Category	Mean $\pm$ SD or N (%)
Age (y)		68.89 $\pm$ 7.32
Gender	Female	244 (50.7)
	Male	237 (49.3)
Employment status	Employee	5 (1.0)
	Retired	134 (27.9)
	Self-employment	133 (27.7)
	Unemployment	209 (43.5)
Marital status	Single	15 (3.1)
	Married	320 (66.5)
	Divorced	6 (1.2)
	Widowed	140 (29.1)
Education level	Illiterate	236 (49.1)
	Elementary	149 (31.0)
	Secondary	26 (5.4)
	High school	41 (8.5)
History of drug use	Academic	29 (6.0)
	No	417 (86.7)
Current drug use	Yes	64 (13.3)
	No	437 (90.9)
Residency with	Yes	44 (9.1)
	Wife	308 (64.0)
	Children	63 (13.1)
History of medicine use	Alone	110 (22.9)
	No	122 (25.4)
Number of children	Yes	359 (74.6)
	No	4.75 $\pm$ 2.24
Physical activity per week (min)		328.17 $\pm$ 418.0
Wealth index	Poorest	96 (20.0)
	Poorer	96 (20.0)
	Middle	94 (19.5)
	Richer	99 (20.6)
	Richest	96 (20.0)

Note. SD: Standard deviation.

the economic situation better, thus improving access to services while reducing the financial concerns of this population group.

The results of our study further revealed that SQ was related to marital status. In other words, the elderly who were divorced had 3.7 times better SQ than those who were single, which is consistent with the findings of Mirzaei et al (26) and Hosseini et al (7). Contrary to the results of the present study, in the study of Aliasgharpour and Eybpoosh (39), no direct relationship was observed between sleep disorder and marital status, which contradicts the effects of the prevailing study. Yue et al (34) found that living alone is associated with poor SQ, which does not match the results of the present study. This contradiction can be attributed to differences in sample, measurement methods, or cultural conditions. It seems that the elderly who participated in this study, who had

Table 2. Relationship of SQ With Demographic Variables

Model	B	SE	P Value
Marital status = Single	Ref.	-	-
Marital status = Married	-0.486	1.034	0.638
Marital status = Divorced	-3.510	1.590	0.028
Marital status = Widow	-1.168	0.908	0.199
Place = With wife	Ref.	-	-
Place = With children	0.656	0.773	0.396
Place = Alone	0.763	0.788	0.333
History of taking certain medicine = No	Ref.	-	-
History of taking certain medicine = Yes	1.064	0.358	0.003
Number of children ≤ 4	Ref.	-	-
Number of children > 4	-0.029	0.311	0.925
Wealth = Poorest	Ref.	-	-
Wealth = Poorer	-.172	0.484	0.722
Wealth = Middle	-0.051	0.490	0.916
Wealth = Richer	-0.245	0.502	0.626
Wealth = Richest	-1.513	0.520	0.004
Anxiety	0.112	0.017	<0.001

Note. SQ: Sleep quality; SE: Standard error; Ref: Reference level; B: Unstandardized coefficients; β : Standardized coefficients

a history of divorce, faced many psychological challenges while living together, and these challenges decreased after divorce; it can be mentioned that this issue also affected SQ. Based on the findings of the present study, SQ was associated with anxiety. Thus, the elderly who were anxious had ten times poorer SQ than those who were not anxious, which corroborates the results of previous studies (39–42). It can be claimed that increased cognitive activity in people with anxiety forms a difficult basis for falling asleep in the elderly, and anxiety is also correlated with a wide range of sleep complaints, demonstrating a high internal relationship between anxiety and sleep complaints (43). The present study had some limitations. This study relied on information obtained from the elderly using a questionnaire. In addition, because of the nature of this study, the relationship between SQ and contributing factors in the elderly is invalid. Considering that this was a cross-sectional study and only examined the relationship between variables, future studies can be conducted to discover and confirm the relationship between SQ and other factors.

Conclusion

The findings confirmed that nearly half of the elderly had poor SQ. Therefore, it is recommended that policymakers and planners in the field of aging focus on socio-economic factors in the elderly in order to make policies and provide better and more services to improve the SQ.

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elderly who participated and cooperated in this study.

Authors' Contribution

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Competing Interests

The authors declare that they have no conflict of interests.

Ethical Approval

This study was conducted after obtaining approval from the Ethics Committee of Neyshabur University of Medical Sciences (IR.NUMS.REC.1402.003).

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